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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|-----------------------------|------------------------|
| 10/774,389 | 02/10/2004 | Toshiya Uemura | PTGF-03083 | 9738 |
| 21254 7590 06/01/2007 MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817 | | | EXAMINER LOUIE, WAI SING | |
| | | | ART UNIT 2814 | PAPER NUMBER |
| | | | MAIL DATE 06/01/2007 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/774,389 | Applicant(s) UEMURA, TOSHIYA | |
| | Examiner Wai-Sing Louie | Art Unit 2814 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 5, 7, and 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Lin et al. (US Pub. 2002/0131145).

With regard to claim 1, Lin et al. disclose a high-efficiency electro-optics device (paragraph [0020] et seq. fig. 5), comprising:

- A semiconductor light-emitting element 260 (the epitaxial structure 260 is the same as epitaxial structure 10 in paragraph [0002]) including a substrate 270, where light radiates from a light emission surface of the substrate 270 of the light-emitting element 260, the light emission surface being provided on the substrate 270 opposite to an electrode forming surface of the substrate (paragraph [0030] to [0031] and fig. 5);
- A transparent structure 250 mounted on the light emission surface of the substrate 270, where the transparent structure 250 comprises a side surface through which to allow the light be discharged from the transparent structure 250 (fig. 5).

With regard to claim 3, Lin et al. disclose the transparent structure 250 has a thickness of half that of the semiconductor light-emitting element 260 to twice the length of a shorter side of the semiconductor light-emitting element 260 (fig. 5).

With regard to claim 5, Lin et al. disclose the transparent structure 250 has a reflection layer 240 formed on its surface (fig. 5).

With regard to claim 7, Lin et al. disclose the electrodes 292 and 294 are electrically connected to the light-emitting element 260 (paragraph [0031]). Inherently, the electrodes are metal bond pads and do not transmit light.

With regard to claims 21-23, Lin et al. disclose the side surface comprises an inclined plane (see surface near reflector 240 in fig. 5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US Pub. 2002/0131145) in view of Lin et al. (US 6,603,151).

With regard to claim 4, Lin 1145' do not disclose the transparent structure 250 has a microscopic uneven surface to diffuse light. However, Lin 151' disclose a light diffuse layer 217 in fig. 5a to diffuse light. Lin 151' teaches the patterned grating like layer 217 can prevent the

Art Unit: 2814

reflected light from going back to the active layer of the epitaxial structure (Lin 151' col. 5, lines 1-5). Therefore, it would have been obvious to one of ordinary skill in the art to modify Lin 1145's device with the teaching of Lin 151' to provide a microscopic uneven surface to diffuse light in order to prevent the reflected light from going back to the active layer of the epitaxial structure.

Claims 6, 8-9, and 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US Pub. 2002/0131145) in view of Lowery et al. (US 6,351,069).

With regard to claims 6, 14-15, and 18-20 Lin et al. disclose one of the lead frame 285 has a cup portion (fig. 5a), and the transparent structure 210 is fixed on the cup portion, but do not disclose the lead frame 285 has a cup portion, the transparent structure 250 is fixed on the cup portion, and the transparent structure 250 is fixed on the cup portion through adhesive resin with light diffusion material mixed in. However, Lowery et al. disclose the LED die 12 is fixed on a reflector cup 14 connected to the lead frame 18 and the adhesive resin 13 mixed with phosphor, which is a light diffusion material (Lowery col. 6, lines 64-67). Lowery et al. teach the phosphor can convert the light into a longer peak wavelength to have a secondary color light (Lowery col. 1, lines 22-25). Thus, it would have been obvious at the time the invention was made to modify Lin's device with the teaching of Lowery et al. to provide light diffusion material in the adhesive resin in order to convert the light into a longer peak wavelength to have a secondary color light.

With regard to claims 8 and 16-17, in addition to the limitations disclosed in claims 1 and 6 above, Lin et al. also discloses:

- Lead frames 285 and 290 that are electrically connected to electrodes 292 and 294 formed on the electrode forming surface through wires (fig. 5);
- Lin et al. modified by Lowery et al. disclose a light transmitting resin 38 that seals the semiconductor light-emitting element 160 and the transparent structure 210 (Lowery fig. 3), the resin 38 including a phosphor 22 to wavelength-convert light emitted from the semiconductor light-emitting element 160 (Lowery col. 7, lines 20-30).

With regard to claim 9, Lin et al. modified by Lowery et al. disclose two kinds of phosphors 22 and 40 (Lowery col. 5, lines 5-7).

Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US Pub. 2002/0131145) in view of Hata et al. (US Pub. 2003/0057434).

With regard to claims 10-11, Lin et al. disclose the light-emitting element 260 comprises a substrate 270, an n-type semiconductor layer, a light-emitting (active) layer, and a p-type semiconductor layer (paragraph [0002]), but do not disclose a buffer layer. However, Hata et al. disclose a light-emitting diode having a buffer layer 11 (Hata paragraph [0057] and fig. 1). Hata et al. teach a buffer layer could reduce the propagation of defects and improve the crystalline quality (Hata paragraph [0019]). Therefore, it would have been obvious at the time the invention was made to modify Lin's device with the teaching of Hata et al. to provide a buffer layer in order to reduce the propagation of defects and improve the crystalline quality. Lin et al. modified by Hata disclose a gallium nitride based semiconductor device.

With regard to claims 12-13, Lin et al. modified by Hata disclose the substrate is sapphire (Hata paragraph [0054]). Lin et al. disclose the transparent structure 210 is ITO, ZnO, IZO CTO etc. However, using sapphire as material for the transparent structure is held as duplication of parts, which would have been obvious. *St. Regis Paper Co. v. Beemis Co. Inc.* 193 USPQ 8, 11 (1977); *In re Harza* 124 USPQ 378 (CCPA 1960).

Response to Arguments

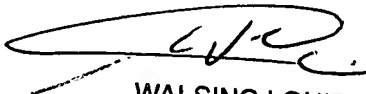
Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2814

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



WAI-SING LOUIE
PRIMARY PATENT EXAMINER

Wsl
May 30, 2007.